Log P-313A

National Transportation Safety Board

Washington, D.C. 20594

Safety Recommendation

Date: MAR 6 1996

In reply refer to: P-96-3

To the Governors of the 50 States
and the Mayor of the District of
Columbia

About 6:45 p.m. on June 9, 1994, a 2-inch-diameter steel gas service line that had been exposed during excavation separated at a compression coupling about 5 feet from the north wall of John T. Gross Towers, an eight-story retirement home operated by the Allentown Housing Authority at Allentown, Pennsylvania. The failed UGI Utilities, Inc., service line released natural gas at 55 psig pressure, and the escaping gas flowed underground to Gross Towers. The gas passed through openings in the building foundation, entered the mechanical room through floor vents, and migrated to other building floors.

About 6:58 p.m., the natural gas that had accumulated within the building was ignited, causing an explosion. A second explosion occurred about 5 minutes later. At the time of the explosion, many of the residents were out of the building. The accident resulted in 1 fatality, 66 injuries, and more than $5 million in property damage.[1]

The National Transportation Safety Board determines that the probable cause of the explosion and fire was the failure of the management of Environmental Preservation Associates, Inc., (EPAI) to ensure through project oversight compliance with its own excavation requirements and the requirements of the Occupational Safety and Health Administration. (The EPAI had an excavation adjacent to the UGI service line.) Contributing to the accident was the failure of the EPAI workmen to notify the UGI that the line had been damaged and was unsupported.

Contributing to the severity of the accident was the absence of an excess flow valve or a similar device, which could have rapidly stopped the flow of gas once the service line was ruptured. Also contributing to the severity of the accident was the absence of a gas detector, which could have alerted the fire department and residents promptly when escaping gas entered the building.

[1]For more information, read Pipeline Accident Report *UGI Utilities, Inc., Natural Gas Distribution Pipeline Explosion and Fire, Allentown, Pennsylvania, June 9, 1994* (NTSB/PAR-96-01).

Since the early 1950s, some manufacturers have offered excess flow valves for large gas service loads, such as industrial facilities, schools, and hospitals. Gas-distribution system operators, who recognized the need to rapidly shut down smaller gas service lines after a rupture to improve public and customer safety, asked the Mueller Company of Decatur, Illinois, to develop a valve that could stop the gas flow on smaller service lines when the flow was excessive. In 1965, Mueller introduced an automatic safety shutoff valve, which became known as an EFV.

In 1970, the Safety Board first identified the need for gas operators to provide a means of rapidly detecting and shutting down failed pipeline segments. Its 1970 report[2] cited an accident that would have likely had substantially less consequence had an EFV been installed in the gas service line:

> On May 29, 1968, a bulldozer working at the front of a children's nursery in Hapeville, Georgia, broke a 1-inch medium pressure gas service line. The bulldozer operator reportedly was unable to locate the buried shutoff valve. In a few minutes, an explosion occurred in the nursery. The ensuing fire engulfed the frame dwelling. Nine people, including seven children, lost their lives. Three other children were seriously injured.

The Research and Special Programs Administration (RSPA), which is the Federal agency that is responsible for the safety of pipelines and is regarded by the public as the leader on such issues, did not require EFVs in the 1970s even though several gas operators were using them successfully and studies showed that EFVs could enhance public safety and were technically and economically feasible and commercially available. The Safety Board initially advocated using EFVs on service lines to such buildings as schools and other buildings in which a large number of people gathered. Later, because EFVs became cheaper and more available, the Safety Board began advocating the installation of EFVs on all service lines.

By 1990, RSPA had not acted to require EFVs. Consequently the Safety Board included the use of EFVs on its 1990 list of most wanted safety recommendations, a list the Safety Board keeps of the safety recommendations that if implemented offer the greatest potential for saving lives.

In December 1990, RSPA issued an Advanced Notice of Proposed Rulemaking asking for comments about the value of requiring EFVs. Because RSPA had not completed action in a timely fashion on the proposed rulemaking, in February 1991, H.R. 977, the Pipeline Safety Act of 1991, was introduced in the House by Representative Curt Weldon. Included in that bill was a mandate for RSPA to require gas operators to install EFVs on all new and renewed gas service lines used to serve single family high-pressure gas service lines. Among his many comments supporting the bill, Representative Weldon stated, "Until now, natural gas safety has never been

---

[2] *Special Study of Effects of Delay in Shutting Down Failed Pipeline Systems and Methods of Providing Rapid Shutdown*, National Transportation Safety Board, December 30, 1970 (NTSB/PSS-71/1).

publicly questioned because natural gas accidents have been poorly catalogued by the Federal Government....The costs associated with natural gas explosions are also grossly underestimated, as are the actual number of deaths." He said that the cost of an accident is usually estimated by an official at the scene based on his first observations and that only the deaths that occur instantly are reported. He said that the expenses of the following are generally not included: what insurance companies pay claimants, the cost of the firemen, policemen, and equipment at the scene; the cost of evacuating residents; the cost of lost business and destroyed personal goods, the cost of the gas lost in fire or to the atmosphere; and the cost of repairing the gas line.

For almost 2 years RSPA did not complete the rulemaking it had started with the 1990 Advanced Notice of Proposed Rulemaking. Its lack of action was recognized by Congress when Congress passed Public Law 102-508 in October 1992. The new law required the Secretary of the Department of Transportation to prescribe within 18 months the circumstances in which natural-gas distribution-system operators would have to install EFVs. Under the same law, Congress gave the Secretary 2 years in which to require gas operators to tell their customers about the benefits of using EFVs and to offer their customers the chance to have EFVs installed at their own expense.

RSPA responded by issuing a Notice of Proposed Rulemaking, which proposed mandating the installation of EFVs in new and renewed single-family high-pressure gas service lines, and later a Notice of Reopening Comment Period to receive comments on a draft proposed by a group comprised of representatives from industry, State governments, the Federal Government, associations, and the public.

Most of the responses to the latter Notice were favorable. One company that commented characterized its system as the nation's largest user of EFVs, with about 20 years experience in their use. It said that although it did not support mandatory use of EFVs, an EFV was a "good, inexpensive, relatively unsophisticated device which can add significantly to the group of safety features in a natural gas distribution system."

A Congressman said many of the more than 9,000 fires that occur each year expose firefighters unnecessarily to the dangers of uncontrolled gas escaping from piping where it connects to the building because manual shutoff valves are inaccessible. He added that frequently valuable time is lost while firefighters wait for the gas company to reach the scene to shut off the flow of gas.

The International Association of Fire Chiefs (IAFC) commented in support of the proposal and expressed its support for requiring the retroactive installation of EFVs on all gas services. The IAFC commented that its members believed that the estimated 1,000,000 plus EFVs to be installed annually would initiate the widespread use of EFVs, which would be a welcome safety feature, especially to firefighters.

A valve manufacturer advised RSPA that of the approximate 800,000 valves it had operating in gas systems, about 900 activated each year and turned potential fires and explosions into routine repair situations causing little or no damage. The manufacturer added that it knew of

a number of gas company operators who had found that EFVs installed in their systems had significantly reduced the losses that would have otherwise occurred. The manufacturer advised also of the following reports it had received from users of its EFVs:

- A New Jersey gas operator advised that it had installed 18,000 EFVs since 1980. Since that time, 125 EFVs had activated to prevent incidents.

- A Pennsylvania gas operator advised that it had installed 50,000 EFVs and that more than 17 activated annually in response to outside-force damage events.

- A Massachusetts gas operator advised that it had installed more than 40,000 EFVs and that more than 40 activated annually in response to outside-force damage events.

- A New York gas operator advised that it had installed 4,000 EFVs since October 1990. In the first 8 months, 40 had activated in response to outside-force damage events.

- An Ohio-based gas operator advised that it had installed 8,000 EFVs in a four-State area. Between January 1992 and June 1993, 144 EFVs had activated in response to outside-force damage events.

- A South Carolina gas operator advised that it had installed 280 EFVs since October 1991. Through June 1993, 15 EFVs had activated in response to outside-force damage events. On June 14, 1993, a motorist struck an above-ground line segment, breaking the service pipe. The EFV immediately stopped the flow of gas. According to the gas system superintendent, without the EFV, a house would have been destroyed by fire, and several gas operator employees would have been severely injured or killed.

- An Ohio gas operator advised that it had installed over 200,000 EFVs. When an electric-utility employee burned through an exposed plastic service line equipped with an EFV, the escaping gas ignited; but the prompt activation of the EFV shut off the flow of gas, causing the fire to extinguish. According to the gas operator, had the EFV not been installed, the employee would probably have been killed.

Another valve manufacturer cited statistics indicating that gas operators responded annually to more than 30,000 instances of damage to pipelines caused by excavators who had not notified the gas operators in advance so the location of the pipelines could be marked before excavation. The commenter advised that EFVs could prove quite useful in minimizing gas releases in such instances.

The gas manager of Popular Grove Utility District in Atoka, Tennessee, advised that although the system had been operating only a short time (since September 1993), his experience with EFVs had always been positive, and EFVs had saved his system money and helped to save lives and property.

In September 1994, 17 congressional representatives cosigned a letter to the Secretary of the U.S. Department of Transportation, expressing their extreme disappointment with the agency's response to the serious problem of pipeline safety in this country and then criticizing RSPA for languishing rather than making a decision about EFVs. The cosigners said that the EFV issue was of great importance to them and urged the Secretary to look into their concerns.

In April 1995, RSPA's Administrator sent letters to the chairmen of the Senate and House committees and subcommittees that oversee pipeline safety, notifying them of RSPA's decision to not require EFVs. Even though the decision was inconsistent with the majority of comments RSPA had received, RSPA advised that it had found no circumstance under which it should issue a Federal rule requiring the **universal** installation of EFVs (emphasis added).

The Safety Board responded by telling the Administrator that it was extremely disappointed with the decision to not require EFVs where gas systems operations were consistent with the performance characteristics of commercially available EFVs. The Board noted that most of the 70 responses to RSPA's Notice of Reopening Comment Period were favorable and that the supporters had included the American Gas Association and the American Public Gas Association, which together represent almost all of the approximately 1,400 gas-distribution pipeline operators in the country. The Board noted that its investigations continued to yield strong evidence of the need to require that there be a way to quickly shut off the flow of gas to a failed pipe segment. The Board added that while the ability to shut off the flow of gas quickly would not prevent accidents, it would significantly reduce their consequences of the accidents.

The National Transportation Safety Board therefore issues the following safety recommendation to all States and the District of Columbia:

> Require gas distribution operators to install excess flow valves in all new or renewed gas service lines, when operating conditions are compatible with commercially available valves, including service lines supplying schools, churches, and other places of public assembly. (Class II, Priority Action) (P-96-3)

Also, the Safety Board issues Safety Recommendations P-96-2 to the Research and Special Programs Administration; P-96-4 through -6 to UGI Utilities, Inc.; P-96-7 to Environmental Preservation Associates, Inc.; P-96-8, through-10 to the Governor of the Commonwealth of Pennsylvania; P-96-11 and -12 to the city of Allentown; P-96-13 to the International Association of Fire Chiefs; P-96-14, through 16 to the Department of Housing and Urban Development; P-96-17 and -18 to the Allentown Housing Authority; P-96-19 to the Associated General Contractors; and P-96-20 to the National Utility Contractors Association.

The National Transportation Safety Board is an independent Federal agency with the statutory responsibility "to promote transportation safety by conducting independent accident investigations and by formulating safety improvement recommendations" (Public Law 93-633). The Safety Board is vitally interested in any action taken as a result of its safety recommendations. Therefore, it would appreciate a response from you regarding action taken or contemplated with

respect to the recommendation in this letter. Please refer to Safety Recommendation P-96-3 in your reply. If you need additional information, you may call (202) 382-0670.

Chairman HALL, Vice Chairman FRANCIS, and Members HAMMERSCHMIDT and GOGLIA concurred in this recommendation.

By: Jim Hall
Chairman

Fob James
Governor
State of Alabama
State Capitol
600 Dexter Avenue
Montgomery, Alabama 36130

Tony Knowles
Governor
State of Alaska
Post Office Box 110001
Juneau, Alaska 99811-0001

Fife Symington
Governor
State of Arizona
State Capitol
1700 W. Washington
Phoenix, Arizona 85007

Jim Tucker
Governor
State of Arkansas
250 State Capitol
Little Rock, Arkansas 72201

Pete Wilson
Governor
State of California
State Capitol
Sacramento, California 95814

Roy Romer
Governor
State of Colorado
136 State Capitol
Denver, Colorado 80203-1792

John Rowland
Governor
State of Connecticut
210 State Capitol
Hartford, Connecticut 06106

Tom Carper
Governor
State of Delaware
820 N. Wilmington
Dover, Delaware 19901

Lawton Chiles
Governor
State of Florida
The Capitol
Tallahassee, Florida 32399-0001

Zell Miller
Governor
State of Georgia
State Capitol
Atlanta, Georgia 30334

Ben Cayetano
Governor
State of Hawaii
State Capitol
235 S. Beretania Street
Honolulu, Hawaii 96813

Phill Batt
Governor
State of Idaho
State House
Boise, Idaho 83720-1000

Jim Edgar
Governor
State of Illinois
State Capitol, Room 207
Springfield, Illinois 62706

Evan Bayh
Governor
State of Indiana
State House, Room 206
Indianapolis, Indiana 46204

Terry E. Branstad
Governor
State of Iowa
State Capitol
Des Moines, Iowa 50319-0001

Bill Graves
Governor
State of Kansas
State Capitol, Second Floor
Topeka, Kansas 66612-1590

Paul E. Patton
Governor
State of Kentucky
State Capitol
700 Capitol Street
Frankfort, Kentucky 40601

Edwin W. Edwards
Governor
State of Louisiana
Post Office Box 94004
Baton Rouge, Lousiana 70804-9004

Angus King
Governor
State of Maine
State House 1
Augusta, Maine 04333

Parris Glendenning
Governor
State of Maryland
State House
Annapolis, Maryland 21401

William F. Weld
Governor
State of Massachusetts
State House, Room 360
Boston, Massachusetts 02133

John Engler
Governor
State of Michigan
Post Office Box 30013
Lansing, Michigan 48909

Arne H. Carlson
Governor
State of Minnesota
75 Constitution Avenue
130 State Capitol
St. Paul, Minnesota 55155

Kirk Fordice
Governor
State of Mississippi
Post Office Box 139
Jackson, Mississippi 39205

Mel Carnahan
Governor
State of Missouri
Post Office Box 720
Jefferson City, Missouri 65102

Marc Racicot
Governor
State of Montana
Governor's Office
State Capitol
Helena, Montana 59620-0801

E. Benjamin Nelson
Governor
State of Nebraska
Post Office Box 94848
Lincoln, Nebraska 68509-4848

Bob Miller
Governor
State of Nevada
State Capitol
Carson City, Nevada 89710